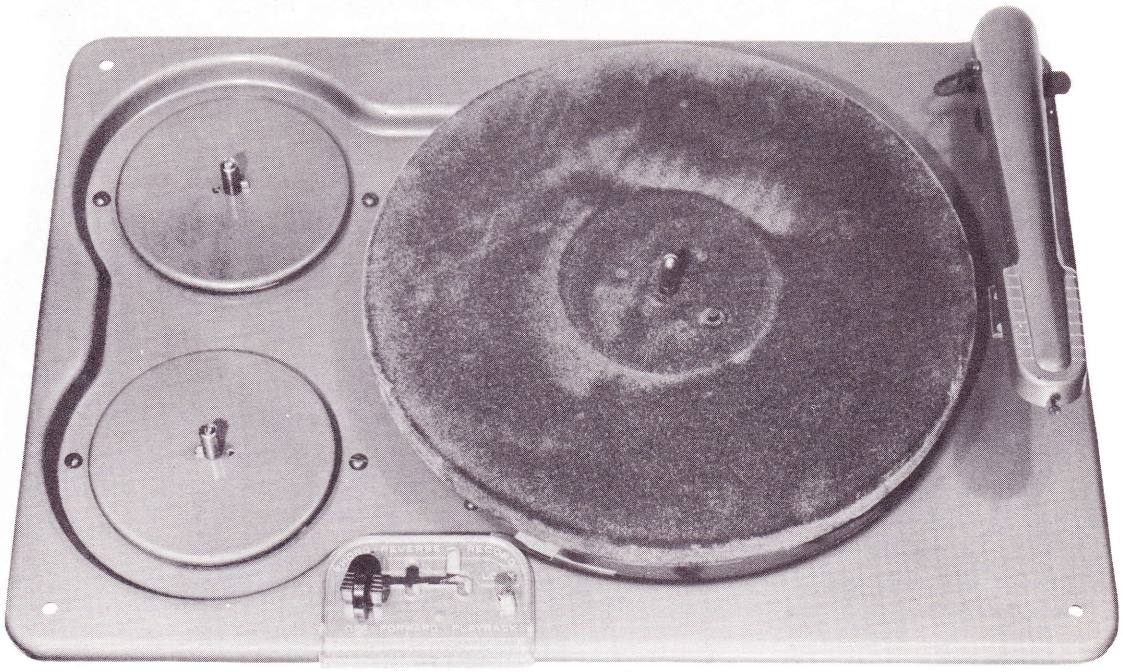

GENERAL INDUSTRIES
MODEL 250

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MODEL 250

GENERAL INFORMATION

The Model 250 Tape-Disc Recorder is designed as a tape recorder, disc recorder, and record player. This mechanism is equipped with a combination pickup and cutter arm. One manual control lever is used for the purpose of shifting the mechanism to its proper position for the following operations; (A) "Off," (B) "Phono," (C) "Forward," (D) Reverse," (E) "Record," and (F) "Playback."

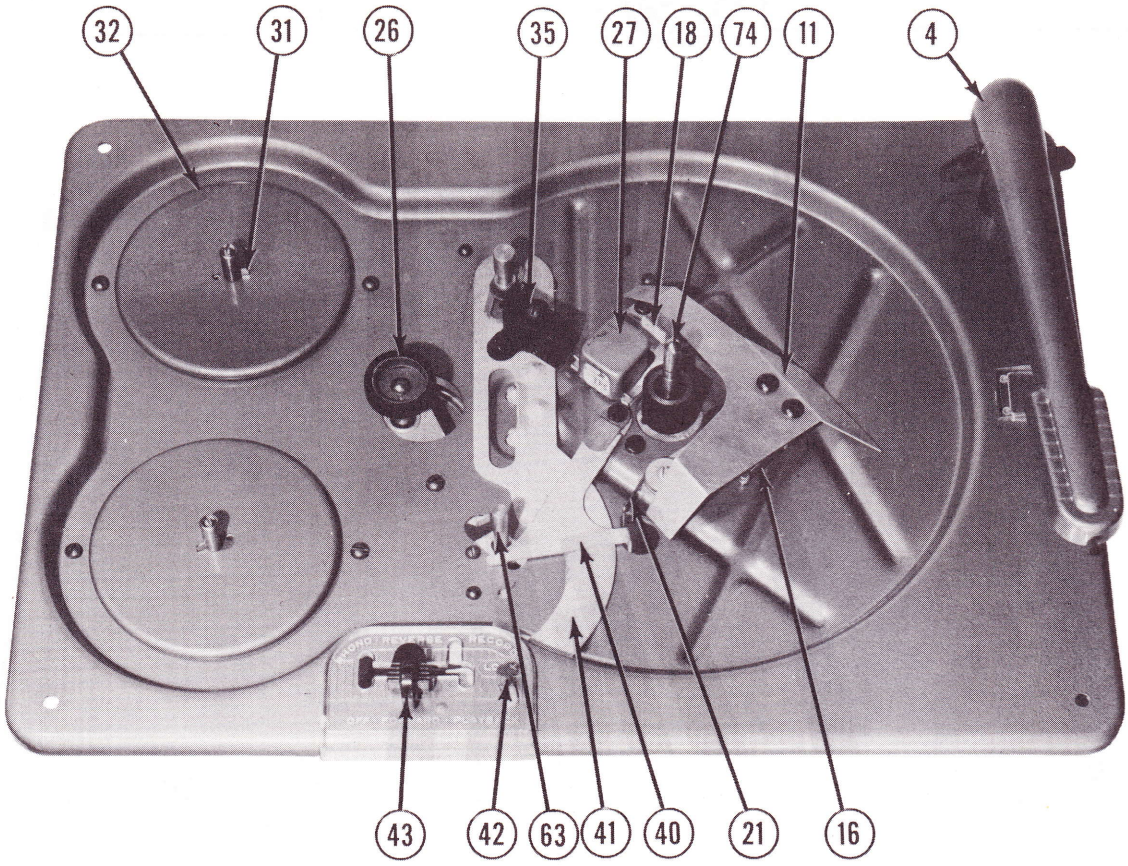
The Model 250 is designed for use with standard 5" reels of 1/4" tape. Either plastic or paper tape can be used. The recording tape travels past the recording head at the rate of 3.75" per second. The mechanism records on two tracks. A 5" reel of tape contains approximately 600 feet of tape, which gives a total recording time of over one hour on one reel of tape. Standard 3" reels can also be used with a proportionate decrease in recording time. Power Supply is 115 volts, A.C. 60 cycles.

Manufactured by:

The General Industries Company
Elyria, Ohio

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA



OPERATING INSTRUCTIONS

Threading of Tape -

(a) Place a reel (3" or 5" diameter) of either plastic or paper base recording tape on the rear reel pan (32) with one slot of the reel engaging key (31). Be sure the magnetic coating of the tape faces the center of the reel.

(b) Place the empty reel on the front reel pan, making sure that the slot in the reel engages the key of the spindle.

(c) Grasp the free end of the tape and unwind approximately three feet of tape. The tape is placed around the turntable and the free end is threaded into the hub of the front reel. The slack in the tape is taken up by turning the front reel clockwise. When tape is tightened, it will slide under the turntable and contact the rubber capstan (74). The recorder is now ready for operation.

Recording -

To record on the tape, move the control knob (43) forward, slightly, and then to the right, until it is aligned with the "Record" position. The control knob (43) is then pushed forward and, at the same time, the record safety button (42) is pulled forward to permit full engagement of the control knob (42) in the "Record" position.

When in the "Record" position, the erase head (35) contacts the recording tape and erases the lower track only at the instant just prior to passing over the recording head (27). Only the lower track of the tape is recorded or played back.

When the rear reel is empty and it is desired to record the upper half of the tape, the front reel, which is now the full one, must be removed from the pan, turned completely over, and transferred to the rear reel pan, making sure that the slot in the reel engages the key (31). The empty reel must be transferred to the front pan. Thread the tape, as previously described, and proceed with the recording in the same manner.

To Rewind -

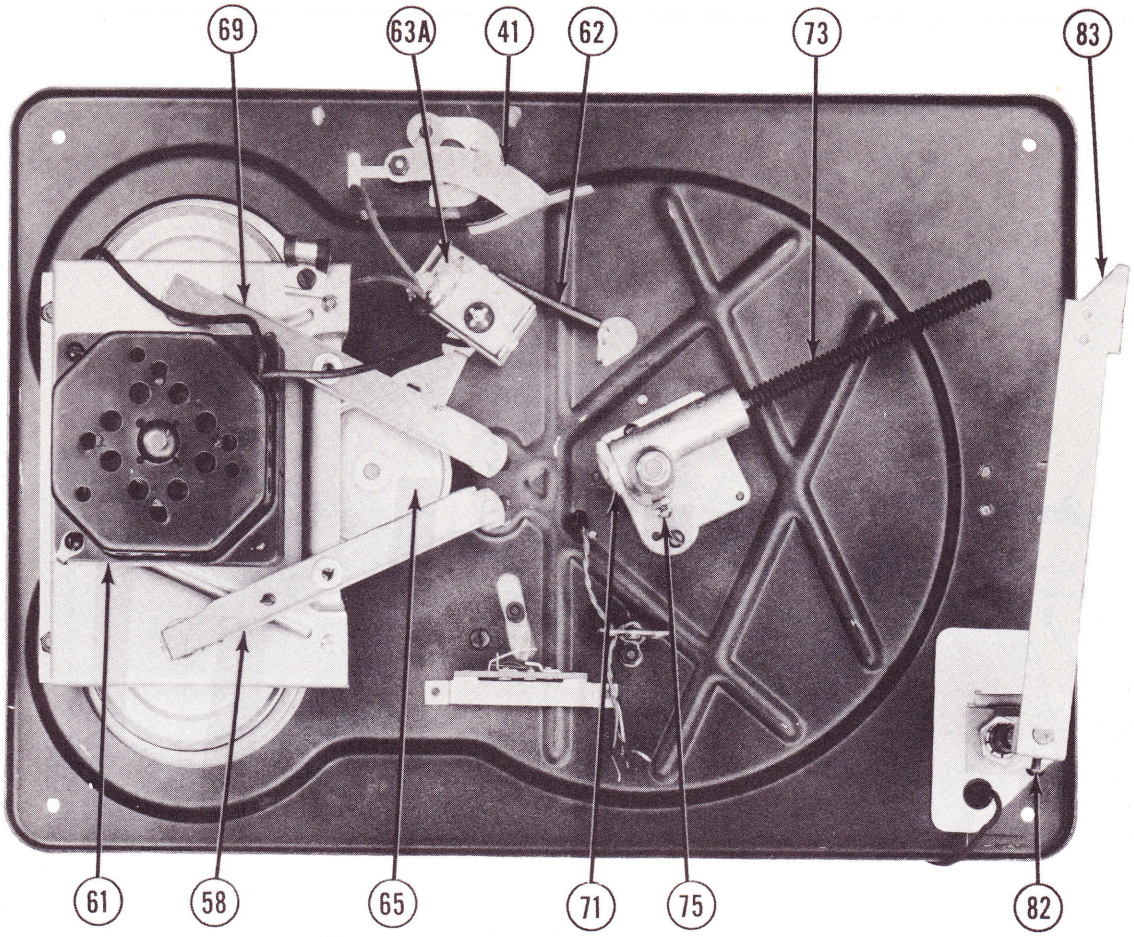
To rewind the tape to the start of the recording, shift the control knob to the position marked "Reverse." Push the control knob into the reverse slot as far as possible. The recorder is now rewinding.

To Stop the Recorder -

The tape may be stopped at any point by shifting the control knob to the position marked "Off."

Playback -

Rewind the tape to the start of the recording (see paragraph on "To Rewind"); that is, if one track only has been recorded. If both tracks have been recorded and the tape is to be played from the start, it will be necessary to remove the reels and transfer them to the opposite reel pans, as described under "Recording." Move the control knob to the "Playback" position. The recorder will now operate for playback.



To Repair or Splice Tape -

In case the tape is broken accidentally, or it is desired to edit a recording, a splice may be made with Scotch tape. Do not use medicated adhesive tape as the adhesive material is not suited to this purpose. The Scotch tape should be applied to the reverse, or uncoated, side of the recording tape. The edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the recording tape so it will pass the various contacts without interference.

Fast-Forward -

If a recording near the end of the tape is desired, the tape may be speeded up by moving the control knob to the "Forward" position.

To Play Standard 78 RPM Records -

To play 78 RPM records, it is only necessary to position the control knob (43) in the "Phono" position. With the control knob in the "Phono" position, the function shift lever (41) depresses both the front and rear reel clutches. This eliminates the driving of the tape, and the only function the unit performs is to rotate the turntable. In playing records, the rear portion of the pickup arm (4) is depressed; a standard playback needle is inserted in the pickup cartridge (6) and is held in position with needle thumb screw.

Cutting Disc Recordings -

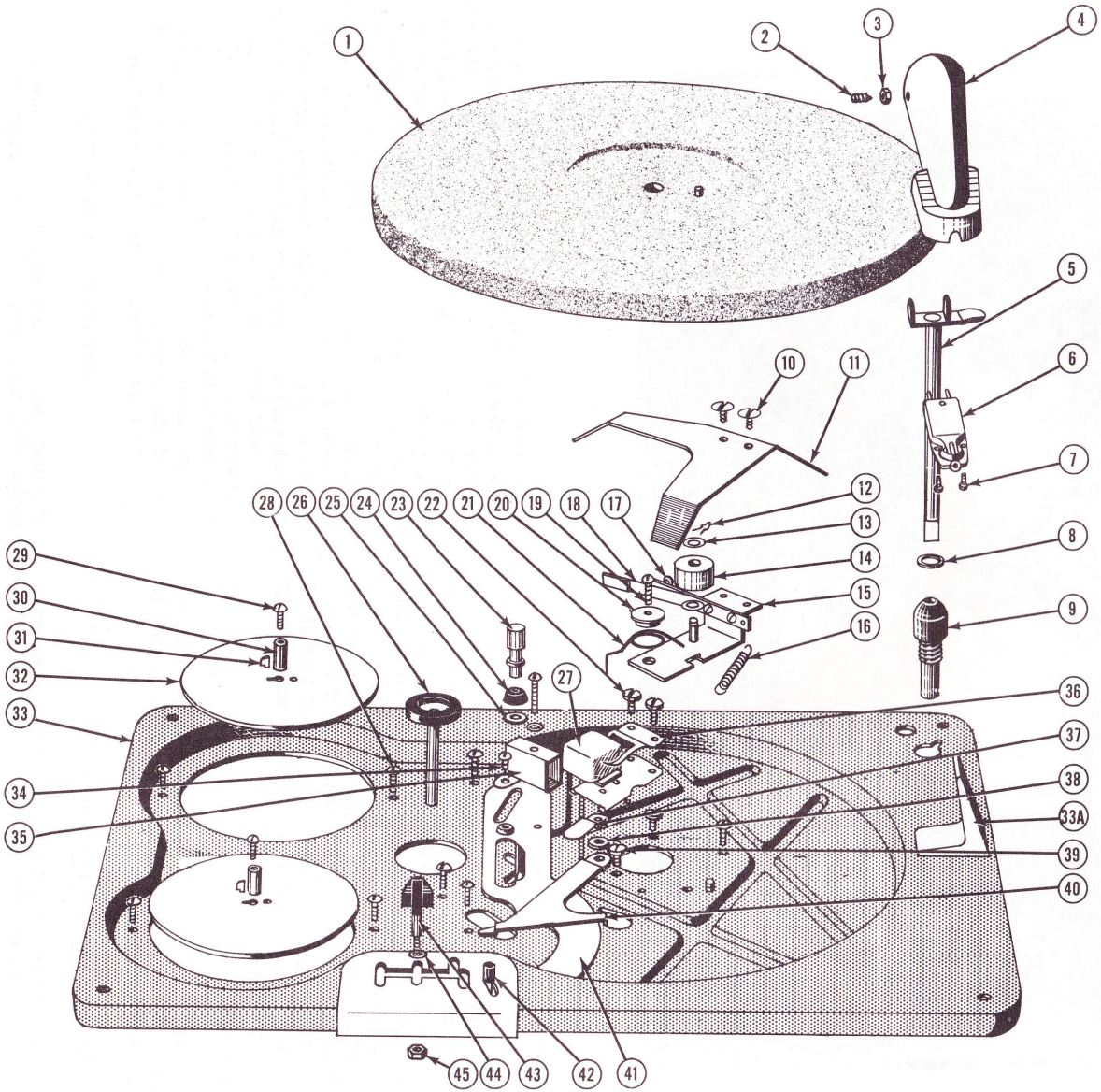
To cut home recordings, it is necessary to remove the playback needle from the cartridge (6) and insert a standard 5/8" recording stylus. Place a recording blank on the turntable with the record driving pin of the turntable through the hole provided in the recording disc. Raise the pickup arm and move it to the edge of the record. Place the recording stylus on the outer edge of the recording blank at the approximate location at which the recording is to start. Raise the rear of the pickup arm by lifting on the ear extending to the right side of the arm. The arm should be raised until the lip on the rear of the follower arm (82) engages the lock spring of the arm lock bracket assembly (80). This holds the arm in a raised position causing the follower arm (83) to engage the lead screw (73). If the recording is being done from some source other than the tape, move the control knob to the "Phono" position. If the recording is to be made from the tape, place the control knob in the "Playback" position.

MECHANICAL FUNCTION

The drive mechanism includes the following: A single motor (61), which drives both the turntable and reeling mechanism through the media of drive belts (50) and (51) and the drive pulley (65). The turntable, in turn, drives the capstan (74). These belts are coupled to the drive pulley (60) which is fastened to the motor shaft.

Operation of the Control Knob (43)
"Off" Position -

When the control knob (43) is in the "Off" position, the shift lever (41), which is fastened to the control knob, is moved against the pin of the switch assembly (63), shutting off the motor power.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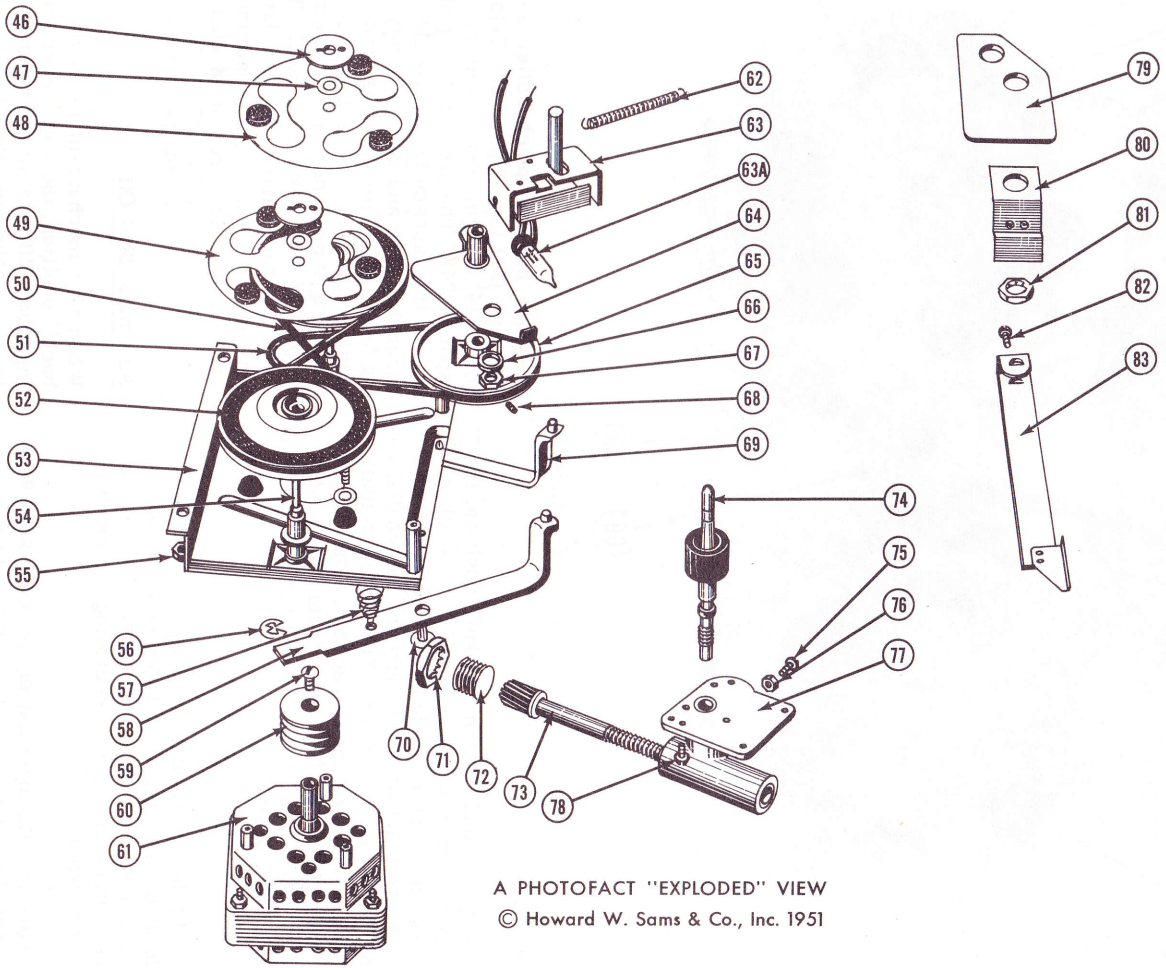
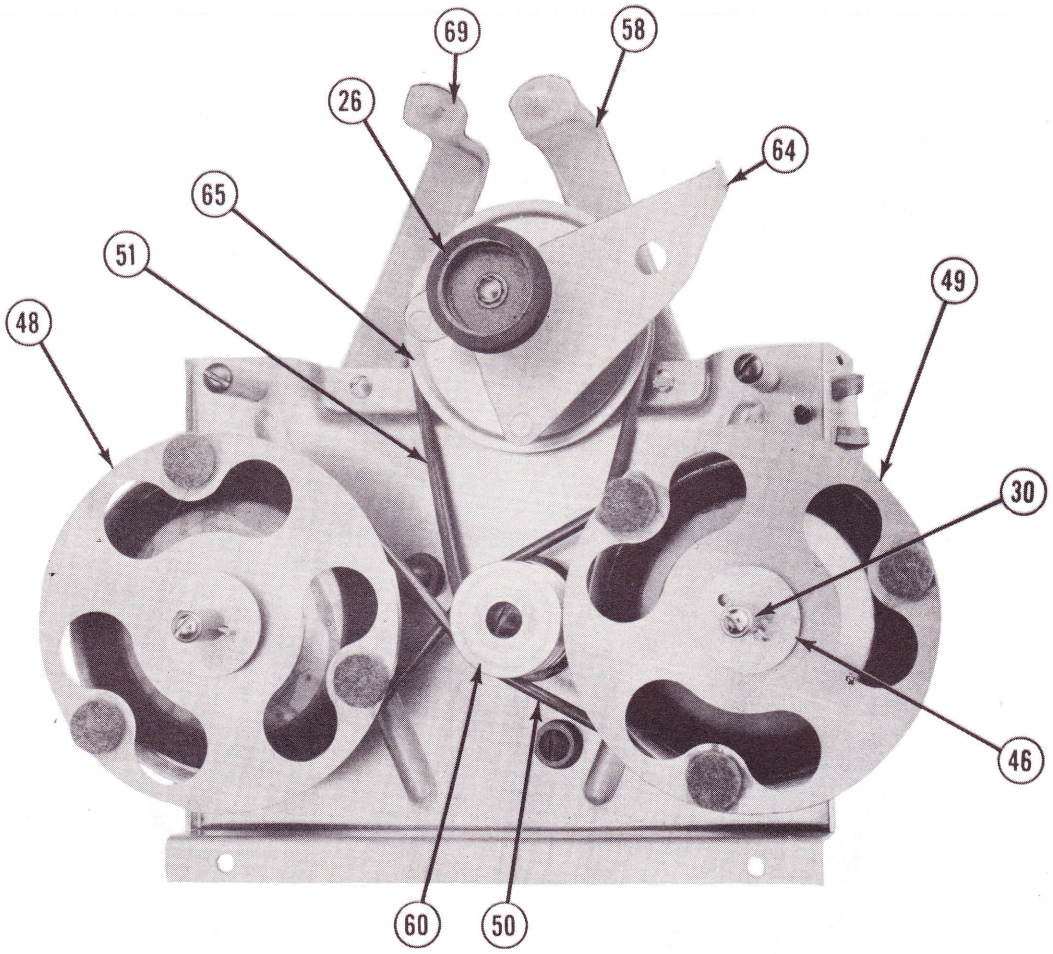


A PHOTOFACT "EXPLODED" VIEW



"Phono" Position -

With the control knob in the "Phono" position, the shift lever (41) is moved away from the switch pin (63). The switch actuator lever (40) then moves against the switch pin, tilting the mercury switch (63A) which turns on the motor power. The switch actuating lever (40) is actuated by spring (62). The switch actuating lever (40) is pushed away from the switch pin (40) by the shift lever (41) when in the "Off-Record and Playback" positions.

"Reverse and Forward" Positions -

When the shift lever (41) is moved to the "Reverse" position, it depresses the lift lever (58) disengaging the front reel from the clutch assembly. The rear pan engages the clutch spring, thus operating the mechanism for Fast Rewind.

For Fast Forward, the position of the reel pans are reversed. The Forward speed is approximately 20 to 1 over the 3-3/4" per second normal recording or playback tape speed.

The Fast Forward and Rewind are accomplished due to the fact that when the shift lever (41) is in these positions - "Forward - Reverse," the pinch roller (14), pressure pad and spring (18) do not contact the tape which gives free movement to reels.

"Record and Playback" -

When the control knob (43) is in either "Record" or "Playback" position, the shift lever (41) contacts the pressure pad and pinch roller assembly actuating spring (21) (see Figure 2). This brings the pinch roller (14) in firm contact with the tape and the driving capstan (74). The pressure pad (18), which is also part of this assembly, is brought into contact with the recording tape and is held firmly against the recording head (27). This assures firm contact between the driving capstan and the tape, as well as holding the recording tape firmly against the recording gap, which is part of the recording head. The driving capstan (74) is, in turn, driven by the large turntable, which acts as a flywheel, thus minimizing any flutter or "wow" effect as a result of changing velocity of the tape.

Automatic Shut Off -

When the mechansim is in the "Record" or "Playback" position, the shift lever (41) and switch actuating lever (40) are moved clear of the switch (63). The tension of the tape then holds the switch in the "On" position; however, when all the tape is wound on the forward reel, the mercury switch is permitted to tip in such a manner as to open the motor circuit, thus automatically stopping the unit.

TROUBLES AND ADJUSTMENTS

Mechanism Does Not Turn On in "Phono-Reverse" or "Forward" Position -

1. Switch actuating spring (62) loose or broken.

(a) Switch actuating spring must be connected to the switch actuating lever (40) so that the actuating lever (40) may tilt the mercury switch to the "On" position. Replace the spring (62).

Turntable Rotates in "Off Position but will not Rotate in any other Position -

1. Mercury switch (63A) turned in wrong direction. Remove mercury switch (63A) from clip of switch bracket and reverse its position (see Figure 3).

Reel Pans (32) Fail to Rotate to Wind the Tape -

1. Lift levers (58) and (69) out of adjustment.

(a) In the "Forward-Speed" position, the rear pan must be raised to the position so that it clears the clutch spring (48). At the same time, the front pan must be lowered to contact the clutch spring (49), and the lift lever (58) must clear the lower end of the front reel pan shaft by approximately 1/32" to 1/16". To adjust the lift lever (58), bend the short unflanged section of the lever immediately under the front reel pan shaft until a space of 1/32" to 1/16" clearance is obtained.

(b) In reverse, the rear reel pan is lowered and the front pan is raised. Adjust the lift lever (69) in the same manner as described above, leaving a clearance of 1/32" to 1/16."

NOTE: In the "Record" and "Playback" positions, the lift levers (58) and (69) must clear both reel pan shafts so that both the pans will contact the clutch springs (48) and (49).

Fails to Record or Playback Properly -

1. Pressure pad spring (18) loose.

(a) Check the screws that hold the pressure pad spring (18) to the mounting plate (15) to see if they are tight.

2. Pressure pad worn or missing.

(a) If the pressure pad is worn some or is out of adjustment, it may be corrected as follows:

Remove the pinch roller cover (11).
Loosen the lock nut on the adjusting screw (17).
Set the shift lever (41) in the "Record" position.
Turn the adjusting screw (17) in against the pressure pad spring (18) until the pressure pad just contacts the recording head (27).
Then turn the screw 1/2 to 3/4 turn clockwise and tighten the lock nut.
Replace the pinch roller cover (11).

(b) If the pressure pad is missing, replace the pad and adjust as above.

3. Spring (21) loose or broken.

(a) If the pressure pad actuating spring (21) is broken or the mounting screw (19) is loose, allowing the spring to slip over the boss on the mounting plate (15), the pinch roller mounting plate will not be pivoted inward when in "Record" or "Playback" position. If this is turn, the tape will not be held against the capstan and recording head.

"Wow" During Disc Recording Operation -

1. Follower arm (83) not engaging lead screw (73) properly. When lifting the rear section of the pickup arm assembly, the follower arm (83) should engage the lead screw (73) before the rear of the pickup arm locks in the raised position. This engagement should be at a point between 1/8" and 1/4" before the pickup arm locks. If it is necessary to adjust this point of engagement, it can be accomplished by slightly bending the follower arm (83). If the follower arm engages the lead screw too tightly, an excessive load will be put on the lead screw, thus injecting "Wow" in the recording. If the engagement is not sufficiently heavy, there is a possibility of grouping, which is the result of the follower arm lifting up on the threads of the lead screw rather than moving along in a smooth and continuous pattern.

LUBRICATION

The recorder unit has been lubricated at time of manufacture, which should be sufficient for a long period of time; however, if the unit is used to a great extent or is subjected to extreme heat or dust, the recorder should be cleaned with carbon tetrachloride and lubricated as follows:

1. To lubricate the reel pan shaft, reel sheave (52), and reel pan clutch springs (48-49):

Remove the "C" washer (56) on the lower end of the reel shaft, and lift the reel pan (32) and clutch springs (48-49) off the machine. Place two or three drops of SAE 10 oil on the reel shaft and the inside of the bearing. Place five or six drops of SAE 20 oil in the countersunk portion of the reel sheave next to the porous bronze bearing. Saturate the felt pads on the clutch springs with SAE 60 oil.

CAUTION: Do not oversaturate the felt pad. Also avoid overlubrication of all parts, as too much oil may come in contact with the rubber drive surfaces of the drive mechanism, causing "Wow."

2. To lubricate the turntable drive wheel shaft (26):

Remove the turntable and place the machine on its edge. Raise the rubber drive wheel (26) in its bearing as far as it will go. Place one or two drops of SAE 10 oil on the wheel shaft.

3. Pivot post (5) and bushing (9). Raise the pickup arm to its highest position and put two or three drops of SAE 20 oil on the post. Move the post up and down several times to equalize the oil on the post.

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	64419	Turntable	39	22903	Screw, used for Mounting Auxiliary Shaft Housing
2	11509	Set Screw			
3	16207	Lock Nut	40	25122	Switch Actuator Lever
4	25149	Tone Arm Complete	41	25134	Function Switch Lever
5	25108	Pivot Shaft Assembly	42	25151	Safety Button
6	25113	Pickup Cartridge - Shure P89R	43	25146	Control Knob
7	12098	Cartridge Mounting Screw	44	3119	Lockwasher, used on Control Knob
8	25168	Felt Washer	45	14463	Hex Nut
9	25126	Tone Arm Pivot Post Bushing	46		Keyed Washer
10	22903	Pinch Roller Cover Plate ing Mounting Screws	47		Washer
			48	25176	Clutch Plate Rear Assembly
11	25193	Pinch Roller Cover Plate	49	25174	Clutch Plate Front Assembly
12	21914	Hairpin Clip	50	25029	Reel Drive Belt
13	21844	Fiber Washer	51	25031	Turntable Drive Belt
14	25186	Pinch Roller Hub and Tire	52	25019	Reel Pan and Clutch Drive Sheave
15	25191	Pinch Roller Mounting Plate and Stud Assembly	53	25013	Sub-Chassis
			54	25037	Reel Shaft
16	30214	Spring for Pinch Roller Mounting Plate	55	22861	Nut, used to Mount Sub-Chassis
			56	25127	"C" Washer
17	11578	Felt Pad Adjustment Screw	57	25091	Spring, used with Lift Lever
18	25182	Felt Pressure Pad and Spring Assembly	58	25084	Lift Lever
			59	22903	Screw, used to Mount Drive Pulley
19	12129	Screw			
20	25177	Shoulder Washer	60	25028	Drive Pulley
21	25178	Pressure Pad Actuating Spring	61	23235	Motor
22	11598	Screw, used for Mounting Recording Head	62	25124	Spring, Switch Actuating
			63	25067	Shut-off Switch Assembly (less Mercury Switch)
23	25132	Tape Guide Post			
24	25131	Rubber Bushing used on Tape Guide Post	63A	25129	Mercury Switch
			64	25054	Drive Wheel Plate and Bearing Assembly
25	25157	Washer for Tape Guide Post			
26	25049	Turntable Drive Wheel	65	25044	Drive Pulley
27	25116	Recording Head	66	25119	Shoulder Washer
28	22376	Screw, used to Mount Motor Sub-Chassis	67	22861	Hex Nut
			68	25056	Set Screw
			69	25084	Lift Lever
29	5871	Screw, used to Mount Disc Plate	70	25088	Tri-Mount Stud, Lift Lever Mounting
30	25034	Sleeve Bushing for Reel Platform Assembly			
			71	13823	Lock Nut for Lead Screw
31	25036	Key Lug used on Reel Platform Assembly	72	21934	End Thrust Screw for Lead Screw
			73	21933	Lead Screw and Gear Assembly
32	25039	Disc Plate used on Reel Platform Assembly	74	25077	Turntable Shaft and Capstan
			75	7534	Lock Screw for Turntable Shaft and Capstan
33	25003	Base Plate			
33A	25147	Tone Arm Rest	76	9569	Lock Nut
34	25167	Screw, used for Mounting Erase Head	77	25079	Auxiliary Shaft Housing
			78	22903	Adjusting Screw, Shaft Housing
35	25072	Erase Head	79	25166	Reinforcing Plate
36	25118	Spring Clip used with Recording Head	80	25102	Arm Lock Bracket Assembly
			81	25153	Lock Nut, Arm Bracket Assembly
37	25121	Spring Clip	82	22376	Lock Screw, Follower Arm
38	25119	Shoulder Washer	83	25098	Follower Arm